

REMARKS

In accordance with the foregoing, claims 10 and 16 have been amended. Claims 10-19 are pending and under consideration.

REJECTIONS UNDER 35 U.S.C. §102:

Claims 10-19 are rejected under 35 U.S.C. §102(b) as being anticipated by Luc (U.S. Patent 4,144,110).

Independent claim 10 recites "the lapped portions being respectively located on the tips of the rotors including the concave portions."

An advantage of this arrangement is that the materials are strongly joined. Present Specification, page 16, line 6 through page 17, line 2; page 20, lines 9-13; FIGS. 20-23.

Independent claim 10 also recites that the rotors being rotated around respective central axes in the opposite directions, pressing the tip of each rotor in a central axis direction, and stirring the metal members in the rotation directions of the rotors.

According to these features, the stirring and plasticity flowing of the joining materials can be promoted, then the materials can be strongly joined and duration of the joining can be shortened. Present Specification, page 16, line 6 through page 17, line 2; page 20, lines 9-13; FIGS. 20-23. In addition, joining can be satisfactorily performed even if the total thickness of the metal members or the number of lapped members is large. Page 4, lines 3-12.

In contrast, Luc discloses an adhesion method of plastic sheets or the like by friction tools 15a, 15b which are placed to be opposite to each other and rotate around the axis perpendicular to the direction where outer circumferential surfaces of the tools press the material. Luc, FIG. 12. FIGS. 8 and 9 of this reference show variant tools which include a partially hollow metal drum 9 with a ring-shaped flat rim 9a, which serves as a frictional surface, and a central concave portion 9b provided with holes which permit suction to be applied through its shaft. FIGS. 20 and 21 of this reference show a plastic sheet adhesion apparatus which forms a plurality of intermittent ring-shaped sealing portions 60 by frictionally joining lapped sheets by a single friction tool 48 having a dome-shaped recess 48a.

The tools 15a and 15b shown in FIG. 12 of the reference do not press the sheets in the direction of their rotational (longitudinal) axes. The metal drum 9 shown in FIGS. 8 and 9 of the reference joins the sheets by only the flat rim 9a, so the circular portions (pills 58) inside the

sealing portions 60 are not sealed. The recess 48a shown in FIGS. 20 and 21 do not stir the sheet material, thus do not have a function of forming the stirred layer to the lapped material.

Accordingly, withdrawal of the rejection of independent claim 10 is requested.
Independent claim 16 recites similar features.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 3-10-04

By: *M. Badagliacca*
Michael J. Badagliacca
Registration No. 39,099

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501